## CLAIMS

SUB A3

1. A process for preparing a solid polymer electrolyte membrane comprising an ion-conducting polymer, a catalyst and a high surface area support material, which process comprises:
   (a) associating the catalyst with the support material to form a catalysed support; and
   (b) combining the catalysed support with an ion-conducting polymer composition.

2. A process according to claim 1, which comprises, as step (b), combining the catalysed support with an ion-conducting polymer in a liquid medium that is aqueous-based and is essentially free from organic solvents.

3. A process according to claim 1 or claim 2, wherein the catalyst comprises one or more precious metals, or combinations thereof, and/or other transition group metals.

4. A process according to any preceding claim, wherein the catalyst comprises platinum.

5. A process according to any preceding claim, wherein the catalyst is deposited onto the support material to a loading of between 0.01 to 50.0% by weight of the total catalysed support.

6. A process according to claim 5, wherein the catalyst is deposited onto the support material at a loading of from 1 to 25 wt% of the total catalysed support.

7. A process according to claim 6, wherein the catalyst is deposited onto the support material at a loading of from 1 to 10 wt% of the total catalysed support.

SUB A4

8. A process according to any preceding claim, wherein the amount of catalysed support incorporated into the membrane is such that the metal loading is lower than $0.1 mg/cm^2$.

9. A process according to claim 8 wherein the amount of catalysed support incorporated into the membrane is such that the metal loading is lower than $0.05mg/cm^2$.

10. A process according to claim 9 wherein the amount of catalysed support incorporated into the membrane is such that the metal loading is lower than $0.03mg/cm^2$.

11. A process according to any preceding claim, wherein the high surface support material is non-electrically conducting.

12. A process according to any preceding claim, wherein the high surface area support material is selected from silica, titania, alumina, zirconium oxides, zirconium silicates, tungsten oxides, tin oxides and zeolites.

13. A process according to any preceding claim, wherein the support material is in the form of fibres.

END $A_4$

14. A process according to any one of claims 1 to 12, wherein the support material is in the form of particles with a mean particle size in the range of from 0.001μm to 10μm.

15. A process according to claim 14, wherein the mean particle size is in the range of from 0.01μm to 5μm.

SUB $A_5$

16. A process according to any preceding claim, wherein the ion-conducting polymer composition is an essentially aqueous solution of a perfluorinated co-polymer with ion-exchange groups.

17. A process according to any preceding claim, wherein the catalysed support, in particle or fibre form, is added directly to a solution of the ion-conducting polymer electrolyte.

18. A process according to any of claims 1 to 11 or 13 to 15, wherein the catalysed support is in particle form and is applied as a binder to form a fibre network to which the ion-

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conducting polymer is subsequently applied to produce the membrane.

19. A process according to any of claims 1 to 13 or 16, wherein the catalysed support is in fibre form and itself is formed into a fibre network which is thereafter bound with a binder, and the ion-conducting polymer is subsequently applied to produce the membrane.

20. A membrane prepared by a process according to any preceding claim.

21. A membrane electrode assembly comprising a membrane prepared by a process according to any one of claims 1 to 19.

22. A fuel cell comprising a membrane prepared by a process according to any one of claims 1 to 19.

23. A fuel cell comprising a membrane electrode assembly according to claim 21.